REMARKS

The present invention is a payment terminal device for coupling to a point of sale device, a mobile phone and a payment center and further, a payment system. A payment terminal device in accordance with an embodiment of the invention for coupling to a point of sale device 26, a mobile telephone 14 and a payment center 1 includes a first interface 19 for coupling the mobile telephone to the payment terminal device 10 to transfer first data information between the mobile telephone and the payment device, wherein the first data information is transferred between the payment terminal device and the payment center which are connected via a mobile cellular telephone to the mobile phone; second interface means 25 for coupling the payment terminal device and the payment center for transferring second data information between the payment terminal device and the payment center; and data processing means 11, coupled to the first and second interface means, for processing data received from the first and/or the second interface means and for generating data for transmission to the first and/or the second interface means; wherein the first interface means comprises coupling means for coupling the first interface means to the mobile telephone, for transferring data between the mobile phone and the processing means via the first interface means; and a modem 12, coupled to the coupling means, for converting the data transferred between the mobile phone and the processing means via the first interface means; wherein data transferred between the processing means and the mobile phone via the modem are transferred between the modem and the mobile telephone as sound data or acoustic data; wherein said second interface means comprises means for converting data

transferred between second interface means and the payment center into data for processing by the processing means and the payment center and vis-a-versa; and wherein the coupling means includes an acoustic coupler 20 for transferring the sound data or the acoustic data between the mobile phone and the payment center device.

One aspect of the present invention resides in a closed loop between the payment terminal device and the payment center which passes through the aforementioned first and second interfaces in which the first interface through an acoustic coupler may be coupled to any conventional cell phone having the conventional speaker and microphone. With the invention, the payment terminal may send similar or complementary data via two different communication paths through the first interface including an acoustic coupler and through the mobile phone to the payment center at the second interface making it futile to intercept or manipulate or simulate only one of the data transfers of the two which are necessary to perform authentication of the purchase.

The aforementioned two-way data transfer makes any kind of authentication and authorization truly fail safe. It is possible to send any arbitrary code sequence in the two directions between the payment terminal device and the payment center. It is sufficient to compare the received messages that are sent via the separate paths with it not being important what data content is actually sent. Literally any type of data source may be utilized for this process of comparing the transmission of the two paths to provide proper authentication.

Since the present invention utilizes an acoustic coupler in the terminal device to couple the voice channel between the mobile phone and the payment center for identifying a user, literally any conventional mobile phone may be used

with it only being necessary that the user of the cell phone confirms the payment process by calling the payment center and identifying him or herself to the payment center. The user closes the second path via the voice channel by placing the mobile telephone on the acoustic coupler to couple the payment terminal to the payment center.

Claims 9 and 16 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The claims have been amended to remove "releasably coupling" and "processible" limitations in order to overcome the stated grounds of rejection.

Claims 16-29 and 31-35 stand rejected under 35 U.S.C. §103 as being unpatentable over EP 1 120 761 (Adolph) in view of EP 0 848 360 (Rossmann). These grounds of rejection are traversed for the following reasons.

The Examiner acknowledges the failure of Adolph to teach data transferred between the processing means and the mobile phone via the modem as sound data or acoustic data. The Examiner reasons that Rossmann discloses the foregoing differences and it would be obvious to modify Adolph in view of Rossmann to arrive at the claimed subject matter. It is submitted that this reasoning is erroneous.

In the first place, independent claims 16 and 29 claim a terminal device in which first data information is transferred between said payment terminal device and said payment center which are connected via a mobile cellular telephone network to the mobile phone wherein data transferred between said processing means and said mobile phone via said modem are transferred between said modem and said mobile telephone as sound data or acoustic data and wherein

said coupling means includes an acoustic coupler for transferring the sound data or acoustic data between said mobile phone and said payment terminal. This subject matter is not disclosed by the combination of Adolf and Rossmann for the following reasons.

Enclosed for the Examiner's consideration is a translation of paragraphs [0020]-[0039] of Adolf. As may be seen from paragraph [0022], a wireless connection is disposed between the payment execution device 1 and the mobile telephone 2 which is disclosed as "[h]owever, a wireless connection such as for example an infrared data connection or a Blue Tooth data connection is preferred, as it is easier to operate". There is no mention of an acoustic connection. Accordingly, the question becomes would it be obvious to utilize an acoustic connection as the Examiner alludes to as being taught by Rossmann to meet the claimed subject matter. It is submitted that a person of ordinary skill in the art would not consider making such a modification except by a resort to impermissible hindsight.

The Examiner correctly notes that Rossmann does refer to in col. 5, lines 34 and 35, that the interface 6, in Fig. 2, "[f]or example, may be 'an acoustic coupling to the earpiece and mouthpiece of the mobile unit...' and also in col. 6, lines 45-47, in the embodiment of Fig. 4 that connectivity between the official's unit 17 and the user's unit 1 may be an "acoustic connection between them". However, the utilization of an acoustic coupling between either an electronic funds transfer at a point of sale (EFTPOS 8 in Fig. 2) and the user's unit 1 or the user's unit 1 and official's unit 17 (in Fig. 4) is not analogous to the claimed first coupling means, including an acoustic coupler which is located between the mobile telephone and the terminal device which mobile telephone also is claimed as

being connected to the payment center 1. In the disclosed acoustic coupling in the interface 6 of Fig. 2, the mobile telephone is only connected to the EFTPOS unit and in Fig. 4 the user's unit 1 is only coupled to the official's unit whereas in independent claims 16 and 29, there is claimed the fundamentally different "first interface means, coupling said mobile telephone to the payment terminal device, for transferring first data information between said mobile telephone and said payment device, wherein said first information is transferred between said payment terminal device and said payment center which are connected via a mobile cellular telephone network to said mobile phone." This has no counterpart in the user terminated connection of the cell phone 1 in Figs. 2 and 4.

Moreover, there is no disclosure in a terminal device of the claimed first interface means comprises coupling means for coupling said first interface means to said mobile telephone, for transferring data between said mobile phone and said processing means via said first interface means; and a modem, coupled to said coupling means, for converting the data transferred between said mobile phone and said processing means via said first interface means; wherein data transferred between said processing means and said mobile phone via said modem are transferred between said modem and said mobile telephone as sound data or acoustic data and wherein said coupling means includes an acoustic coupler fro transferring the sound data or the acoustic data between said mobile phone and said payment terminal device." This subject matter is not suggested by either Adolph or Rossmann.

There is no rationale in the record why a person of ordinary skill in the art would consider modification of Adolph to provide the foregoing claimed subject matter disposed between the payment execution device 1 and the mobile

telephone 2 of Adolph except by resort to impermissible hindsight. Moreover, this subject matter provides a distinct advantage in the claimed system in that any mobile telephone may be used instead of the requirements of a special purpose telephone of the type described as the mobile telephone 2 in Adolph.

Moreover, there is no counterpart of the claimed use of a mobile phone which completes a two-way transmission path from the mobile telephone to the claimed payment center in order to provide authentication using the simple means of a conventional telephone and an acoustic coupler in a terminal device to facilitate that transfer as claimed. Adolf only uses electromagnetic transmissions and does not have any recognition that a simplified system utilizing an acoustic coupler in a terminal device by combination with a conventional acoustic transmission capability of a phone to complete the data transmission as claimed.

It is submitted that there is no information in the record which would suggest to a person of ordinary skill in the art to modify Adolf to implement an acoustic coupler in a terminal device to access data stored in a mobile phone which includes utilizing the built-in speaker and microphones of the mobile phone for a digital data input or output to the mobile phone. With the present invention, sound or voice data are not decoded or evaluated by the mobile phone. The data is only transmitted acoustically from the phone by the user to provide the user with the ability to utilize his or her mobile phone in combination with a payment terminal device using simple mechanisms found on conventional telephones.

In view of the foregoing amendments and Remarks, it is submitted that each of the claims in the application are not rendered obvious by the proposed combination of Adolf and Rossmann except by impermissible hindsight. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (1123.44203X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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DES:dlh

Translation of paragraphs [0020] to [0039] of the European patent application EP1120761 (A2)

[0020] Fig. 1 schematically shows the structure of a system according to the present invention for executing cash-less payment. The system comprises a payment execution device 1 and a mobile telephone 2.

[0021] The payment execution device 1 is typically a cash register of a retail store, and comprises a keyboard 3, a display 4 and a receipt printer 5. The keyboard, the display 4 and the receipt printer 5 are connected via a data bus 6. The data bus 6 is connected to a processing unit 7 and to a storage/memory unit 8. Additionally, interface devices 9, 10 may be connected to the data bus, through which a data connection via a data line 11 to a clearing office 12 or a data connection via data line 13 to an inventory management system 14 may be established.

[0022] The payment execution device according to the invention further comprises a driver arrangement 15 for a transmitter/receiver arrangement 16, forming an interface for communicating with the mobile telephone 2. The driver arrangement 15 is connected to the data bus 6. The transmitter/receiver arrangement is for example an infra red transmitter/receiver that can send and receive infra red signals. Any other transmitter/receiver arrangement which is capable of locally transferring data is suitable for the invention. In principle it is also possible to provide a data line to the mobile telephone that may be inserted at the mobile telephone by means of a plug, instead of a wireless connection. However, a wireless connection such as for example an infra red data connection or a Bluetooth data connection, is preferred, as it is easier to operate.

[0023] The driver arrangement 15 serves for converting the digital signals obtained via the data bus 6 into respective analogue signals for outputting them via the transmitter/receiver arrangement 16 or for converting the analogue signals received by the transmitter/receiver arrangement 16 into respective digital signals that are then forwarded to the data bus 6.

[0024] The data bus is connected to an encoding/decoding arrangement 17 by which messages may be encoded or decoded. Secret or public keys may be used for encoding. The encoding/decoding arrangement 17 may also be used for checking if a message has been received completely or if a message has been manipulated. For this purpose different methods are known, for example determining and evaluating checksums. Such an encoding/decoding arrangement 17 serves for messages incoming at the payment execution

device as verification arrangement that verifies the messages with respect to authenticity, correctness and/or completeness.

[0025] The mobile telephone 2 comprises a data bus 18, a processor unit 19, a storage/memory unit 20, a keyboard 21 and a display 22. A driver arrangement 23 for driving a transmitter/receiver arrangement 24 is connected to the data bus 18. The driver arrangement 23 and the transmitter/receiver arrangement 24 correspond in their function and are compatible to the driver arrangement 15 and the transmitter/receiver arrangement 16 of the payment execution device 1, so that the transmitter/receiver arrangement 24 of the mobile telephone 2 can send signals to or can receive signals from the transmitter/receiver arrangement 16 of the payment execution device 1.

[0026] The mobile telephone 2 in turn comprises an encoder-/decoder arrangement 25 by which the data transferred to the driver arrangement 23 can be encoded or by which data received from the driver arrangement 23 can be decoded. The encoder-/decoder arrangement 25 operates like the encoder-/decoder arrangement 17 of the payment execution device 1, wherein it is especially provided with a signing functionality for generating a digital signature of the user of the mobile telephone 2. Therefore this encoder-/decoder arrangement 25 represents a signing arrangement.

[0027] The data bus 18 of the mobile telephone 2 is connected to a high-frequency-driver arrangement 26 by which the telephone signals of the mobile telephone 2 can be sent or received via an antenna 27.

[0028] The data connection established via said transmitter-/receiver arrangements 16, 24 allows a local transmission of data between the mobile telephone 2 and the payment execution device 1. It is independent from a telephone network and can therefore also be established within a room of a building in which the payment execution device and a respective mobile telephone 2 are located and in which a connection to the telephone network is not possible. Usually the rooms in which the payment execution device 1 is located are sales rooms 28. Such as sales room 28 is indicated in Fig. 1 by the frame 28 shown in interrupted lines.

[0029] The mobile telephone may establish a radio connection to a telephone network via the high-frequency-driver arrangement 26 and the antenna 27. In figure 1 the telephone network is schematically depicted by an antenna 29, a receiver station 30 related to the antenna 29 and a telephone line 32 from the receiver station 30 to a network operator 31.

[0030] The clearing office 11 can be connected to the network operator 31 via a data line 33.

[0031] Preferably, the data lines 11 and 33 are secure data lines, such as e.g. dedicated lines, that are inaccessible for third parties. With today's progressing development in the field of cryptography it is in principle also possible to assure the safety of the data transfer by cryptographic methods, so that it is also possible to use an open network connection as data line 11, 33, in which the data streams may be read by third parties, and wherein it is assured that third parties can not understand the data streams.

[0032] In the following different embodiments of the system depicted in figure 1 are explained by means of figures 2 to 7.

[0033] According to the embodiment of figure 2 only a one-way data connection from the mobile telephone 2 to the payment execution device 1 is established. The payment operation is performed as follows:

[0034] In a shop the user of the mobile telephone 2 is verbally requested by a cashier (or a teller) operating the payment execution device to pay a defined amount. The user of the mobile telephone enters a respective payment confirmation into the keyboard of his mobile telephone and sends this payment confirmation to the payment execution device via the local data connection that is independent of the telephone network. Prior to transmittal the payment confirmation is encoded by the encoder-/decoder arrangement 25 of the mobile telephone 2, and is then sent via the driver arrangement 23 from the transmitter-/receiver arrangement 24 to the payment execution device 1. This receives the signal via its transmitter-/receiver arrangement 16 and the driver arrangement 15 and decodes the signal by means of its encoder-/decoder arrangement. The payment confirmation signal comprises e.g. identification information identifying the owner of the mobile telephone 2 and information on the clearing office. This information is critical information and is therefore stored as a key or in an encoded way in the mobile telephone. The information on the owner of the mobile 2 is represented e.g. in form of an electronic signature.

[0035] The information transferred with the payment confirmation signal are decoded and verified in the payment execution device by means of the encoder-/decoder arrangement 17. On the basis of the identification information the business partner is identified and on the basis of the information on the clearing office it is determined to whom the money can be debited. The clearing office may be an arbitrary company which e.g. by means of a direct

debit procedure debits to the respective amount to the account of the user of the mobile telephone 2. However, it is also possible that a clearing office is a bank or a credit card issuer that debits a respective account. The network operator of the telephone network to which the mobile telephone 2 belongs may also serve as clearing office that adds the amount to be paid to the user's telephone bill. The debiting procedure may be performed independently of the original payment confirmation. It may be appropriate to store all payments of a day in the storage unit 8 of the payment execution device 1, and to transfer them after closing time to the clearing office. This may be performed via a data connection online or alternatively by a data carrier offline.

[0036] For checking the solvency of the user of the mobile telephone 2 a blacklist may be deposited in the storage unit 8 of the payment execution device, by which it may be checked which users of a mobile telephone are not sufficiently solvent. If such a check shows that there is no sufficient solvency this may be displayed on the display 4 of the payment execution device 1 so that the teller may cancel the payment process.

[0037] This embodiment shows that for executing a payment only a data connection in a single direction from the mobile telephone 2 to the payment execution device 1 is necessary. Such an embodiment provides the user of the mobile telephone with the advantage that a manipulation of the security relevant data (identification information, information on the clearing office) stored on the mobile telephone 2 is definitively impossible. The data connection between the payment execution device 1 and the clearing office 12 or between the mobile telephone 2 and the network operator 31 is not used during the payment operation between the user of the mobile telephone 2 and the teller. This data connection can be used to exchange the respective data at a later point of time. For example the keys for the digital signature of the user of the mobile telephone 2 can be exchanged in regular intervals via the telephone network with the network operator 31.

[0038] These keys may be secret keys that are passed by the network operator 31 to the mobile telephone 2 and to the payment execution device 1 in regular intervals, so that at any time the respective messages can correctly be encoded and decoded. The keys may also be public keys that are generated in regular intervals by the encoder-/decoder arrangement 25 in the mobile telephone 2 and that are passed via the telephone network and the network operator 31 to the payment execution devices.

[0039] Figure 3 depicts an embodiment in which the data connection between the payment execution device 1 and the mobile telephone 2 is implemented bi-directionally, so that data

are transferred from the payment execution device 1 to the mobile telephone 2 as well as from the mobile telephone 2 to the payment execution device 1. This embodiment differs from the one of figure 2 in that the teller enters the amount to be paid into the keyboard 3 of the payment execution device 1, and upon a respective actuation of the teller a payment request is sent from the payment execution device to the mobile telephone 2. The payment request comprises e.g. the information on the amount to be paid and possibly also information on the good to be bought therewith. The user of the mobile telephone 2 can read this payment request on the display 22 of the mobile telephone 2 and confirm it with a respective input. Thereby he triggers the sending of a payment confirmation that is send to the payment execution device 1 as in the embodiment described in conjunction with figure 2. Otherwise the method is identical to the above embodiment.